CLAIMS

1. An isolated PinX1 polynucleotide comprising a sequence of SEQ ID No. 1 or SEQ ID No. 2,

2. An isolated PinX1-L1 polynucleotide comprising a sequence of SEQ ID No. 5.

3. A vector comprising the polynucleotide of claim 1 or 2.

4. A host cell comprising the DNA vector of claim 3.

5. The isolated polynucleotide of claim 1 or 2, said polynucleotide molecule being covalently coupled with a detectable label.

6. The isolated polynucleotide of claim 5, wherein said detectable label is one selected from the group consisting of: radiolabel, fluorescent label, chemiluminescent label and colorimetric label.

7. An isolated PinX1 polypeptide comprising SEQ ID No. 3 or SEQ ID No. 4.

8. An isolated PinX1-L1 polypeptide comprising SEQ ID No. 6.

9. A polyclonal antibody specifically immunoreactive with a PinX1 polypeptide comprising SEQ ID No. 3 or SEQ ID No. 4.

10. A monoclonal antibody specifically immunoreactive with a PinX1 polypeptide comprising SEQ ID No. 3 or SEQ ID No. 4.

11. A mouse hybridoma cell line for generating the monoclonal antibody of claim 10.

12. The antibody of claim 9 or 10, said antibody being covalently coupled with a detectable label.

13. The antibody of claim 12, wherein said detectable label is one selected from the group consisting of: radiolabel, fluorescent label, chemiluminescent label and colorimetric label.

14. A method for diagnosis of a cancerous or precancerous condition in a mammal, said method comprising performing a detection step to detect a hybrid formed between a probe and a biological sample from said mammal, said probe comprising a sequence complementary to 15 or more

consecutive nucleotide sequence of SEQ ID No. 1 or SEQ ID No. 5, wherein the absence of a detectable hybrid is indicative of said cancerous or precancerous condition.

15. The method of claim 14, further comprising the step of comparing the amount of said hybrid detected in said biological sample with the amount of a control hybrid detected comprising said probe and a target polynucleotide comprising SEQ ID No. 1 or SEQ ID No. 5 in a control sample, wherein a reduction of the amount of detectable hybrid relative to said control hybrid is indicative of said cancerous or precancerous condition.

16. The method of claim 14 or 15, wherein said probe is covalently coupled with a detectable label.

17. The method of claim 16, wherein said detectable label is one selected from the group consisting of: radiolabel, fluorescent label, chemiluminescent label, and colorimetric label.

18. A method for diagnosis of a cancerous or precancerous condition in a mammal, said method comprising performing a detection step to detect an amplification of 50 or more consecutive nucleotide sequence of SEQ ID No. 1 or SEQ ID No. 5 in a biological sample from said mammal using one or more of primers, each said primer being complementary to said consecutive nucleotide sequence, wherein an absence of said amplification is indicative of said cancerous or precancerous condition.

19. The method of claim 18, further comprising the step of comparing the amount of said amplification detected in said biological sample with the amount of a control amplification detected comprising said primers and a target polynucleotide comprising SEQ ID No. 1 or SEQ ID No. 5 of a control sample, wherein a reduction of the amount of said amplification relative to said control amplification is indicative of said cancerous or precancerous condition.

20. The method of claim 18 or 19, wherein said amplification is by a polymerase chain reaction.

21. A method for diagnosis of a cancerous or precancerous condition in a mammal, said method comprising performing a detection step to detect the formation of a complex between an antibody and a polypeptide comprising SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6 in a biological sample from said mammal, wherein an absence of the formation of said complex is indicative of said cancerous or precancerous condition.

22. The method of claim 21, further comprising the step of comparing the amount of said complex detected in said biological sample with the amount of a control complex detected comprising said antibody and a target polypeptide comprising SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6 of a control sample, wherein a reduction of the amount of said complex relative to the amount of said control complex is indicative of said cancerous or precancerous condition.

23. The method of claim 21 or 22, wherein said antibody is covalently coupled with a detectable label.

24. The method of claim 23, wherein said detectable label is one selected from the group consisting of: radiolabel, fluorescent label, chemiluminescent label and colorimetric label.

25. The method of claim 14, 18 or 21, wherein said cancerous condition is selected from a solid tumor and a leukemia.

26. The method of claim 14, 18 or 21, wherein said mammal is human.

27. A method for reducing telomerase function in an eukaryotic cell comprising contacting said eukaryotic cell with a polynucleotide comprising SEQ ID No. 1, SEQ ID No. 2 or SEQ ID No. 5, and expressing said polynucleotide in said eukaryotic cell in an amount sufficient to reduce telomerase function.

28. A method for reducing telomerase function in an eukaryotic cell comprising contacting said eukaryotic cell with a polypeptide comprising SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6 in an amount sufficient to reduce telomerase function.

29. The method of claim 27, or 28, wherein said reduction of telomerase function is determined by measuring one or more of: a reduction in telomerase enzymatic activity, a reduction in telomere length, a reduction in cell proliferation, an induction of senescence, and an induction of crisis in said cell.

30. The method of claim 27, or 28, wherein said eukaryotic cell is a mammalian cell.

31. The method of claim 30, wherein said mammalian cell is a human cell.

32. A method for preventing or treating a cancerous condition in a mammal comprising administering a therapeutically effective amount of a polynucleotide comprising SEQ ID No. 1, SEQ ID No. 2 or SEQ ID No. 5.

33. A method for preventing or treating a cancerous condition in a mammal comprising administering a therapeutically effective amount of a polypeptide comprising SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6.

34. The method of claim 32 or 33, wherein said therapeutically effective administration results in a reduction in tumor size.

35. The method of claim 32 or 33, wherein said therapeutically effective administration results in a reduction in number of tumor cells.

36. The method of claim 32 or 33, wherein said mammal is a human.

37. The method of claim 32 or 33, wherein said polynucleotide or polypeptide is administered as a pharmaceutical composition further comprising a pharmaceutically acceptable carrier.

38. A method for increasing telomerase function in an eukaryotic cell comprising contacting said eukaryotic cell with a polynucleotide comprising an antisense polynucleotide complementary to the corresponding mRNA sequence comprising SEQ ID No. 1 or SEQ ID No. 5 in an sufficient amount to increase telomerase function.

39. A method of increasing telomerase function in an eukaryotic cell comprising contacting said eukaryotic cell with an antibody in an sufficient amount to increase telomerase function, said antibody being specifically immunoreactive with a polypeptide comprising SEQ ID No. 3 or SEQ ID No. 6.

40. The method of claim 38 or 39, wherein said increase of telomerase function is determined by measuring one or more of: an increase in telomerase enzymatic activity, an increase or maintenance in telomere length, an increase in cell proliferation, a reduction of senescence and a reduction of crisis in said cell.

41. The method of claim 38 or 39, wherein said eukaryotic cell is a mammalian cell.

42. The method of claim 41, wherein said mammalian cell is a human cell.

43. A method for preventing aging in a mammal comprising administering a therapeutically effective amount of an antisense polynucleotide complementary to the corresponding mRNA sequence comprising SEQ ID No. 1 or SEQ ID No. 5.

44. A method for preventing aging in a mammal comprising administering a therapeutically effective amount of an antibody, wherein said antibody is specifically immunoreactive with a polypeptide comprising SEQ ID No. 3 or SEQ ID No. 6.

45. The method of claim 43 or 44, wherein said mammal is a human.

46. The method of claim 43 or 44, wherein said antisense polynucleotide or antibody is administered as a pharmaceutical composition further comprising a pharmaceutically acceptable carrier.

47. A pharmaceutical composition comprising a therapeutically effective amount of a polynucleotide comprising SEQ ID No. 1, SEQ ID No. 2 or SEQ ID No. 5.

48. A pharmaceutical composition comprising a therapeutically effective amount of a polypeptide comprising SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6.

49. A pharmaceutical composition comprising a therapeutically effective amount of an antibody specifically immunoreactive with a polypeptide comprising SEQ ID No. 3 or SEQ ID No. 6.

50. A pharmaceutical composition comprising a therapeutically effective amount of an antisense oligonucleotide complementary to the corresponding mRNA sequence comprising SEQ ID No. 1 or SEQ ID No. 5.

51. The pharmaceutical composition of claim 47, 48, 49, or 50, further comprising a pharmaceutically acceptable carrier.

52. A method for screening for an agent which modulates the binding between a polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) and a Pin 2 polypeptide, said method comprising:

(a) incubating a mixture comprising said polypeptide (SEQ ID No. 3 or SEQ ID No. 4), a Pin2 polypeptide, and a candidate agent, wherein said incubating whereby, but for the presence of said agent, allows said polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) to bind to said Pin2 polypeptide to form a complex;

(b) detecting said complex formation in (a); and

(c) comparing said complex detected in (b) with a control comprising said polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) and said Pin2 polypeptide in the absence of a candidate agent, wherein an absence, an increase, or a reduction of said complex detected in (b) is indicative of said candidate agent modulating the binding activity of said polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) to said Pin2 polypeptide.

53. A method for screening for an agent which modulates the binding between a polypeptide comprising SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6 and a Pin 2 polypeptide in an eukaryetic cell, said method comprising:

(a) contacting said eukaryotic cell with a candidate agent, wherein said contacting whereby, but for the presence of said agent, allows said polypeptide comprising SEQ ID No. 3 SEQ ID No. 4 or SEQ ID No. 6 to bind to said Pin2 polypeptide to form a complex in said cell;

(b) detecting said complex formation in (a); and

(c) comparing said complex detected in (b) with a control cell without contacting said control cell to said candidate agent, wherein an absence, an increase, or a reduction of said complex formation in (b) is indicative of said candidate agent modulating the binding activity of said polypeptide comprising SEQ ID No. 3 or SEQ ID No. 4 or SEQ ID No. 6 to said Pin2 polypeptide.

54. A method for screening for an agent which modulates the binding between a polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) and a telomerase polypeptide, said method comprising:

(a) incubating a mixture comprising said polypeptide (SEQ ID No. 3 or SEQ ID No. 4), a telomerase polypeptide, and a candidate agent, wherein said incubating whereby, but for the presence of said agent, allows said polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) to bind to said telomerase polypeptide to form a complex;

(b) detecting said complex formation in (a); and

(c) comparing said complex detected in (b) with a control comprising said polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) and said telomerase polypeptide in the absence of a

candidate agent, wherein an absence, an increase, or a reduction of said complex detected in (b) is indicative of said candidate agent modulating the binding activity of said polypeptide (SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6) to said telomerase polypeptide.

55. A method for screening for an agent which modulates the binding between a polypeptide comprising SEQ ID No. 3, SEQ ID No. 4 or SEQ ID No. 6 and a telomerase polypeptide in an eukaryotic cell, said method comprising:

(a) contacting said eukaryotic cell with a candidate agent, wherein said contacting whereby, but for the presence of said agent, allows said polypeptide comprising SEQ ID No. 3 SEQ ID No. 4 or SEQ ID No. 6 to bind to said telomerase polypeptide to form a complex in said cell;

(b) detecting said complex formation in (a); and

(c) comparing said complex detected in (b) with a control cell without contacting said control cell to said candidate agent, wherein an absence, an increase, or a reduction of said complex formation in (b) is indicative of said candidate agent modulating the binding activity of said polypeptide comprising SEQ ID No. 3 or SEQ ID No. 4 or SEQ ID No. 6 to said telomerase polypeptide.

56. The method of claim 52, 53, 54 or 55, wherein said complex detection is through an antibody, said antibody being specifically immunoactive to a polypeptide comprising SEQ ID No. 3 or SEQ ID No. 6.

57. The method of claim 56, wherein said antibody is covalently coupled with a detectable label.

58. The method of claim 57, wherein said detectable label is one selected from the group consisting of: radiolabel, fluorescent label, chemiluminescent label, and colorimetric label.

59. A method for screening for an agent which modulates the expression of a polynucleotide comprising SEQ ID No. 1 or SEQ ID No. 5 in an eukaryotic cell, said method comprising:

(a) contacting said eukaryotic cell with a candidate agent;

(b) detecting the expression of said polynucleotide in said eukaryotic cell; and

(c) comparing the expression of said polynucleotide in (b) with a control cell without contacting said control cell to said candidate agent, wherein an increase or a decrease of the expression of said polynucleotide in (b) is indicative of said candidate agent modulating the expression of said polynucleotide.

60. The method of claim 59, wherein said expression detection is through a probe or a pair of primers, each said probe or primer having a sequence complementary to the sequence of said polynucleotide.

61. The method of claim 60, wherein said expression detection is by a polymerase chain reaction.

62. The method of claim 59, wherein said expression detection is through an antibody, said antibody being specifically immunoactive to a polypeptide comprising SEQ ID No. 3 or SEQ ID No. 6.

63. The method of claim 60 or 62, wherein said polynucleotide or said antibody is covalently coupled with a detectable label.

64. The method of claim 63, wherein said detectable label is one selected from the group consisting of: radiolabel, fluorescent label, chemiluminescent label, and colorimetric label.

65. A method for screening for an agent as a binding partner to a Pin2 polypeptide comprising SEQ ID No. 8, said method comprising:

(a) incubating a mixture comprising said Pin2 polypeptide and a candidate agent, wherein said incubating allows said Pin2 polypeptide to bind to its binding partners to form a complex; and

(b) detecting said complex formation between said Pin2 polypeptide and said candidate, wherein a presence of said complex formation is indicative of said candidate agent being a binding partner to said Pin2 polypeptide.

66. A method for treating a cancerous condition in a mammal comprising administering a therapeutically effective amount of an agent which enhances the binding between a PinX1 polypeptide comprising SEQ ID No. 3 or SEQ ID No. 4 or SEQ ID No. 6 to a Pin2 polypeptide,

wherein said administration restores the binding between said PinX1 polypeptide and said Pin2 polypeptide to a normal level.

67. A method for treating a cancerous condition in a mammal comprising administering a therapeutically effective amount of an agent which increases the expression of a PinX1 polynucleotide comprising SEQ ID No. 1 or SEQ ID No. 5, wherein said administration restores the expression of said PinX1 polynucleotide to that of a normal level.

68. The method of claim 66 or 67, wherein said therapeutically effective administration results in a reduction in tumor size.

69. The method of claim 66 or 67, wherein said therapeutically effective administration results in a reduction in number of tumor cells.